ER-2: Collaborate to Manage Congestion

Strategic Planning Team → Telcon every 2 Hrs → Strategic Plan of Operations → Repeat
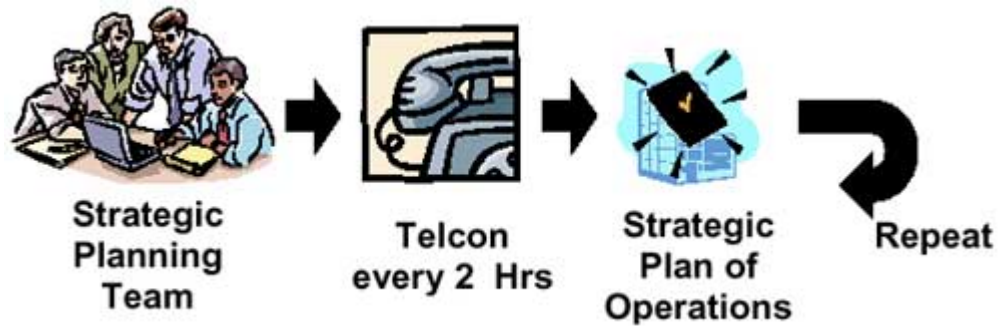
Congestion may appear for brief periods of time at non-routine locations or at different hours of the day. Sharing predictions with users and allowing them to plan accordingly may avoid such congestion. Coordination of a game plan for likely events is done ahead of time to ensure an effective response. Based on results from the collaborative process used for the severe weather season of spring/summer 2000, a collaboratively developed training program was implemented for the spring/summer 2001, which prepared controllers, pilots, and airline dispatchers to manage the congestion systemically. Collaborative decision making and information sharing will continue to be emphasized in response to enroute congestion for 2002.

Key Dates

Operational Rules and Process Changes (Annual Cycle)   2002

Recurrent Training, focused on technical, process or procedural changes (Annual Cycle)   2002

ER-2: Collaborate to Manage Congestion

Processes, procedures and techniques to collaboratively mitigate en route congestion.
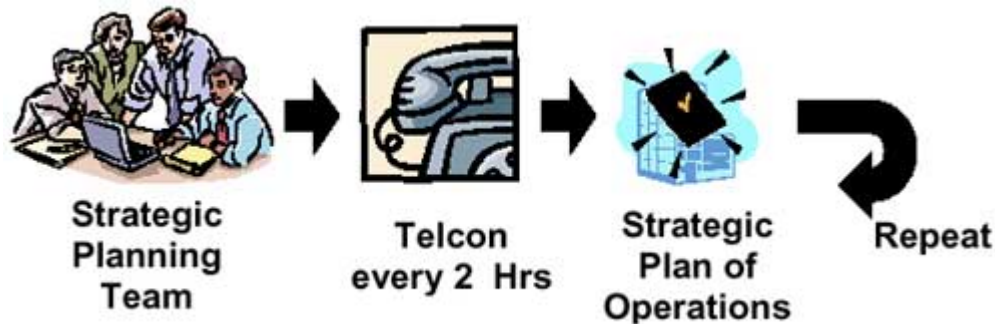
Background

Certain areas of the national airspace system (NAS), such as Chicago to the northeastern U.S. corridor and others east of the Mississippi River, are highly complex and geographically limited. Overall increases in airspace demand, and significant increases during peak demand periods routinely lead to congestion, which can have a ripple effect throughout the NAS, even under the best conditions. These situations (similar to severe thunderstrorm situations) require a system wide choreographed effort to minimize service disruption. The Strategic Planning Team (SPT) process, launched by the Spring/Summer 2000 initiative, was designed to foster the effort.

The SPT conducts a telcon among the major facilities and the user community every two hours to discuss the status of the system, constraint projection, and to develop the Strategic Plan of Operations (SPO). The SPO is a collaborative agreement on how to deal with severe weather and other flow constraints and to provide a degree of predictability for all stakeholders by providing a common view of system issues with a look ahead of two to four hours. The spring of 2000 was the inaugural year for the SPT/SPO process. Significant progress was made during the severe weather season of 2000, however issues remain and improvements can be made. For example, increasing specificity in the strategic plan, finding balance in meeting stakeholder objectives, reducing the need for tactical initiatives through improved planning, extending the feedback mechanism to capture front line employees including controllers, pilots and airline dispatchers, improving communication methods, and improving technology.

Ops Change Description

Operational changes will be seen as a continuous improvement to the strategic planning process and system predictability. There will be increased collaboration and greater common situational awareness by utilization of new technologies, such as the Flow Evaluation Area (FEA) and Flow Constrained Area (FCA). FEA/FCA functions available to Traffic Management Units (TMUs) on the Traffic Situation Displays (TSD). The NAS user likewise will access and discuss public FCAs through the use of the Common Constraint Situation Display (CCSD), which provides limited web based access to the Enhanced Traffic Management System (ETMS). Enhancements and greater distribution of the Flight Schedule Monitor (FSM) will provide airport traffic

demand and capacity maximization capabilities. Improvements in Ground Delay Programs (GDP) functionality and refinement of ground stop (GS) procedures in conjunction with FEA/FCA functionality will provide alternatives to collaboratively manage severe weather constraints in the en-route environment. Communication sharing methods, such as the Traffic Management National Log (TMNL), the ATCSCC web site, the CCSD, and the Web Situation Display (WSD) will enhance collaboration for both internal and external traffic managers.

Other operational changes will include process and procedure as identified through analysis, feedback and review, including integration of new technologies, as they are made available to the traffic managers. Yearly training will play an integral role for ensuring success of the solution. In addition, the Traffic Flow Management (TFM) system will undergo a modernization effort that will improve the timely identification of constraints, access to this information by the user community, and improved collaboration and execution mechanisms that will greatly enhance the implementation of TFM initiatives.

The operational changes are evolutionary and thus will span the entire timeframe of near, middle, and long term (2001-2010) and most likely beyond as well. The following sections address the operational changes described.

- ER-2.1: Improved collaboration and communication through shared information.

- ER-2.2: Menu of enhanced pre-planned options.

- ER-2.3: Technology: improved predictability of congestion and resolution assessment

- ER-2.4: Training: Expansion of Joint FAA/Airline Initial Training, Recurrent Training, and Analysis

Benefit, Performance and Metrics [suggested data source]

- Increase on-time arrival rate. [Department of Transportation statistics]

- Increase on-time departure rate. [OPSNET, Aviation System Performance Metrics (ASPM)]

- Decrease excess taxi times (> 1 hour). [ASPM]

- Reduce the number and/or duration of ground delay programs due to volume congestion. [Flight Schedule Analyzer (FSA), ATCSCC logs]

- Reduce the number and/or duration of ground stops due to volume congestion. [FSA, ATCSCC logs]

- Decrease the variance in scheduled throughput against actual. [ASPM, OPSNET]

- Decrease estimated time en route. [ASPM]

- Decrease minutes of en route delay. [ASPM, OPSNET]

- Increased predictability of the NAS as indicated by increase in flown as filed. [POET]

- Decrease airborne holding [ATCSCC holding reports]

ER-2.1: Improved Collaboration and Communication through Shared Information on FAA/NAS Users Plans and Constraints

Scope and Applicability

- **Near Term:**

ATCSCC WEB:

The information provided on the ATCSCC web site (internet based information dissemination system that provides NAS information) will be updated to provide timely NAS status data with the greatest clarity possible, including information needed for the strategic planning process. (Under continual review)

Accomplishments:

o Diversion Recovery Tool (DRT): Entered prototype use 6/01.

o Previous Strategic Plan of Operation added to ATCSCC web site (Summer 01).

o Aviation System Performance Metrics (ASPM) expanded 34 airports (8/1/01):

ATL	DFW	LAS	ORD	STL
BOS	DTW	LAX	PHL	TPA
BWI	EWR	LGA	PHX	
CLE	FLL	MCO	PIT	
CLT	HNL	MDW	SAN	
CVG	IAD	MEM	SEA	
DCA	IAH	MIA	SFO	
DEN	JFK	MSP	SLC	

Traffic Situation Display (TSD)

The TSD is a sub-system of the Enhanced Traffic Management System (ETMS), which provides NAS information, constraint information (monitor alert parameters (MAP), FEA/FCA), flight data, and weather radar to the ATCSCC, and field facilities.

Note: ETMS is a flight data processing and distribution system that utilizes historical flight routings, flight intent information, and actual aircraft position.

o The Enroute Working Group report supports this through a recommendation to continue development of a Flight Plan Pre Processor (FP^3) prototype. (11/01)

o Additional tests of FEA/FCA are planned.

Accomplishments:

o Flow Evaluation Area (FEA)/ Flow Constrained Area (FCA) functionality has been deployed on the TSD. Users access will be provided through the CCSD.

o CCSD (without FCA) published on ADTN and CDMnet (6/29)

o Phase 1 of FCA deployed 6/18/01. Remote patch 7.2.7 entered 8/7/01.

o Live Test of FEA/FCA conducted with airlines 11/01

o RVR expanded to 42 airports (11/30/01)

ATL	DCA	HOU	MIA	RDU
BFI	DEN	IAD	MSP	SAN
BOS	DFA (DFW	IAH	OAK	SEA
BUR	east)	IND	ONT	SFO
BWI	DFB (DFW	LAX	ORD	SJC
CLE	west)	LGB	PDX	SLC
CLT	DPA	MCO	PHL	SNA
CVG	DTW	MDW	PHX	STL
DAL	GJT	MEM	PIT	TPA

Traffic Management National Log (TMNL)

The FAA's Traffic Management National Log (TMNL) program (an intra FAA Air Traffic Services computer based communications and reporting system for controllers and traffic management personnel to record and distribute daily operational information) will provide a more efficient method of capturing and disseminating information on restrictions (e.g., airport runway configuration changes can be entered and effected facilities addressed for notification).

o TMNL deployed at 7 beta sites (9/5/01).

o TMNL Version 1.22, Enhancements to the viability of the restriction process (scheduled 2/02)

o TMNL expansion to most ARTCC's planned for Spring 2002

Collaborative Decision Making network (CDMnet)

Users systems such as the Collaborative Decision Making Network (CDMNet) (a collective network routed through the Volpe Center providing two-way real-time operational data exchange such as cancellation information and NAS status) is continuing to be expanded for better data quality and increased user participation to enhance system demand predictability.

o Simplified Substitution Rules (SSR) deployed 5/01.

S2K+1 Improvements

Spring/Summer 2001 (S2K +1) process improvements are completed including:

o Collaborative S2K +1 field training (Remove, Covered in ER 2.4)

o 24-hour SPT/severe weather unit staffing.
SPT scheduled for 24-hour coverage 5 days per week (4/01)
Seven-day per week coverage will begin 4/02.

o Pre SPT checklist usage.
A Pre-SPT checklist and other methods were evaluated and tested. The evaluation determined that the previous SPO was the best starting point to prepare for the next TELCON. The current and previous SPO are now published on the ATCSCC web site.

o Increased staffing levels at FAA field facilities.
A budget request has been made for 95 additional traffic management personnel.

o Improved Pre/Post communication of the SPO.
A "Stand-up" briefing has been instituted to occur at 8:00AM and 4:15PM daily at the ATCSCC. Participants include Operational Management, Weather Unit personnel, ATA, NBAA, and staff representatives. (4/01)
Responsibilities and procedures for the Severe Weather Coordinator position have been refined to provide for improved communication (5/01).
Initiating development of procedures for East/West coordinator position to improve internal communication (completion expected 1/02).

o Develop collaborative "rules of the road" procedures.
The 2002 Enroute working group has developed recommendations for Flexible Rules for the Operation of the NAS During Severe Weather. Evaluation of the recommendations will be complete by Spring 2002.

o Collaborative Convective Forecast Product (CCFP) extended to 24-hour operation during severe weather season, March-April.

- **Mid-Term:**

Enhanced Traffic Management System (ETMS) enhancements:

o Improved data quality:

Improve ETMS data for predictability in order to make better traffic management decisions, for example implement an early intent filing process (three to four hour pre departure).

The Enroute Working Group report supports this through a recommendation to continue development of a Flight Plan Pre Processor (FP^3) prototype. (11/01)

o NAS status and constraints descriptions will be enhanced through updated versions of FEA/FCA functionality and based on user feedback. Integration of the CCSD and WSD is included for facilities and users needing web access. Collaborative Routing Coordination Tool (CRCT) re-route functionality will be incorporated into the ETMS. (CRCT is a prototype tool that utilizes aircraft trajectory modeling along with flight schedule information to produce "what if" decision support capabilities).

ETMS 7.4, planned for March 2002, incorporates the following additional CRCT functionality:

Time-in-FCA display

Include FCA in TSD replay

- **Long-Term:**

Traffic Flow Management Modernization:

- o Interactive TFM through improved insight into airport conditions and departure queuing.

- o Improved system impact assessment capability to evaluate TFM strategies and monitor progress towards selected initiative.

- o Improved equity through common situation awareness, access to system constraint information and improved predictability in the system.

Data Quality:

- o Continuous improvement of data provided by the FAA and NAS users for enhanced collaboration.

- o ETMS 7.5, planned for October 2002, incorporates the following additional CRCT functionality:

Initial routing functions (to be defined)

Key Decisions

- o Data quality standards adopted (e.g., timely cancellation notification that will allow maximum utilization of available airport capacity).

- o Data sharing parameters adopted (e.g., inclusion of GA flight intent as early as possible).

- o Common metrics identified for operational analysis and problem identification.

- o Common goals and targets adopted to achieve a "System Thinking" approach.

- o Operating "rules of the road" adapted to foster equitability for user groups.

- o Expanded authority of the FAA to enforce compliance when "gaming" of the system is identified.

Key Risks

- • Access to data and information that is currently considered to be sensitive or company proprietary is at issue. There are security, company proprietary, and privacy restrictions

on some of the information that has been requested for inclusion in the information exchange.

- The numbers of stakeholders (airspace users and FAA facilities) that need to be involved in the collaborative participation, due to incomplete intent data, the need for an agreed upon reduced en route capacity rationing process.

- Data sharing enhancements.

- Systems connectivity between stakeholders may not be fully established due to the diversity of stakeholder systems or operational environments (e.g., major air carriers AOC fully connected to decision support tools through the CDMNet versus a single business jet operator whose preflight information comes from an Fixed Base Operator (FBO) or DUATS).

ER-2.2: Menu of Enhanced Preplanned Options for Congestion Management

Scope and Applicability

- **Near, Mid-, and Long-Term**

Coordination of route modifications in a timely manner was a high priority item going into the spring of 2000. The goal of reducing the time needed to express clearance changes over already congested voice frequencies necessitated abbreviating the clearances in a standardized and database adaptable format. The National Playbook, Coded Departure Routes (CDR), and low altitude programs (CAPing, Low Altitude Arrival and Departure Routes - LAADR) are identified ways of achieving this goal.

The Playbook and CDRs have been used successfully during congestion situations during the year 2000 and LAADR, while only used at St. Louis under an MOU between ZKC and TWA, has shown to be an effective program. Enhancement to these programs, such as, program expansion, and improved distribution is a continual process. Playbook and Coded Departure Routes are available on the ATCSCC web site and the CDM web site.

The National Playbook is scheduled for incorporation to ETMS version 7.4 (3/02)

Accomplishments:

Route Management Tool (RMT)/CDR:

CDR's are also available using the Route Management Tool (RMT) through ADTN and CDMnet.

FAA Notice 7210.507, Coded Departure Routes (effective 6/15/01), establishes procedures, responsibilities, process, and cycle. The process follows the standard 56-day publication cycle.

The RMT has been enhanced to include a graphical route depiction (6/01).

A preview of CDR's to be published is available 25-30 days prior to publication through the Route Management Tool or on the data disk distributed by the National Flight Data Center (NFDC).

More than 13,000 CDR's are available for use (12/01).

Playbook:

o Identify cycle and process for updating published, "plays". (Complete)

FAA Notice 7210.517, National Playbook (effective 12/18/01), establishes the procedures, responsibilities, process, and cycle for the National Playbook. The process follows the standard 56-day publication cycle.

The Playbook is currently on the 56-day update cycle on the ATCSCC web.

A total of 126 plays are included in the National Playbook (11/01).

o Post updates on the ATCSCC web site. (Complete)

A Preview version of the new Playbook is placed on the ATCSCC website 7-14 days prior to the publication date

o Altitude Programs:

LAADR agreement established between ZMP and NWA (5/01)

Five National Playbook Routes through Canada are being added with an effective date of 12/27/01.

Key Decisions

- Increase incorporation of pre-planned routes into flight planning systems and aircraft flight management systems (FMS).

Key Risks

- Dynamics of tactical real-time situations often require revision of pre-planned options.

- Improved coordination and communication when activating pre-planned options or changes to pre-planned options may require automation improvements to FAA/User systems.

ER-2.3: Technology: Improved Predictability of Congestion and Resolution Assessment

Scope and Applicability

The enhancements of existing decision support systems and the addition of new decision support systems (DSS) and/or tools will improve the timeliness, accuracy, and quality of congestion predictions and resolutions. In the near, mid, and long term, continuous improvement programs to increase predictability of congestion and provide quality resolution assessment are:

- The Web Situation Display (WSD), an web based version of the TSD:

  Available via the Intranet 10/00.

  Available via secure Internet to remote FAA and DOD users 8/01.

- Enhancements to the Collaborative Convective Forecast Product (CCFP) that will provide a more accurate view of long-term convective weather constraints.

  CCFP integration to the TSD planned for ETMS v7.4, 3/02. The function will provide traffic Managers a better ability to correlate the anticipated impact with the traffic prediction.

- Enhanced Traffic Management System (ETMS) upgrades (i.e. FCA functionality) which will better define airspace capacity reductions and support resolution capabilities.

  o ETMS version 7.2 Major Functionality

    - Phase 1 FCA deployed 6/01

    - Expanded Flight database deployed 5/01

    - Addition of Northern Hemisphere Winds information deployed 5/01

    - Addition of departure fix information deployed 5/01

    - RVR data available 5/01

  o FCA functionality integrated into ETMS version 7.3 (11/01)

    - Moving FCA (heading and velocity)

    - Flight filters*

    - NAS elements used to specify an FCA (e.g., sector, route)

    - Examine multiple FCAs at same time

    - Expanded ability to share FCA
      SAVE and RECALL option for FCA

    - Delete expired FCAs automatically at night

    - Identify facility creating the FCA
      Browse functions for FCA **

- Delete multiple FCAs **
- Initial routing functions
  - o FCA functionality to be integrated into ETMS version 7.4 (3/02)
    - Show "entering flights" counts in bar chart and timeline
    - Time-in-FCA display
    - Include FCA in TSD replay

- Continued evaluation of the Collaborative Routing and Coordination Tool (CRCT) functionality to be transferred to the FCA tool.

  CRCT core team developed and recommended identified functionality transfer to ETMS (4/01)

- Complete full adaptation of the Departure Spacing Program (DSP) to assist in maximum delivery of aircraft from the terminal area.

  Expansion to the Boston and Washington metropolitan areas is planned for Fall 02.

- Improved capabilities and processes for Ground Delay Programs (GDP's) implemented in support of SWAP for en-route congestion.

  The Enroute Working Group recommendation encourages continued development of FSM capabilities for the enroute environment to be available Spring 2002.

Key Decisions

- Decision Support Systems (DSS) integration.

- Establish an Early Intent Program.
  Decide whether or not to continue development of the Flight Plan Pre Processor prototype.

- Quality of input data for strategic planning time horizons is highly variable. Improve data quality, access and usage will need to be revisited or established.

ER-2.4 Training: Expansion of Joint FAA/Airline Initial Training, Recurrent Training, and Analysis

Scope and Applicability

- **Near-, Mid-, and Long-Term**

  All participants in strategic planning for traffic flow management (Users and FAA) need to have common training on Traffic Flow Management (TFM) techniques, procedures, and processes. The following programs have begun prior to the Spring 2001 convective weather season and will be on going as part of a continuous improvement process.

Development of the training program for 2002 will build off the successes of an integrated training concept employing development and delivery consistent with the collaborative approach. Work groups have begun this process in June 2001 for the spring 2002 time frame.

- Accomplishments:

  Completed Collaborative S2K+1 Field Training:

  - o S2K+1 Field Training (FAA course #55082) conducted 02/01 through 03/01 at 28 domestic and 1 international facilities. A total of 3024 people (2729 FAA and 295 airline personnel) received the training.

  - o Three "Introduction to System Thinking and ATCSCC Operations" (ATCSCC "option A") training courses were conducted at the ATCSCC in 03/01. A total of 71 people (63 FAA, 8 airline) received the training.

  - o System Operations Advocacy Training conducted at the ATCSCC: 01/01 – 46 attendees.

  - o Leadership Pair Training conducted in two phases: 03/01 through 05/01. Training included Facility Managers, NATCA leadership and Traffic Management Officers from New England Region, Eastern Region, Great Lakes Region, Southern Region, Kansas City Center, Memphis Center, Houston Center, Minneapolis Center, Denver Center, Albuquerque Center, Salt Lake Center, Seattle Center, Oakland Center, and Los Angeles Center.

  - o National Traffic Management Course #50113 throughout 2001: 16 classes held, 420 FAA attendees and 112 Industry attendees.

  - o Air Traffic Tactical Operations personnel traveled to field facilities for familiarization: 33 field facilities and 9 airlines operations centers were visited.

  - o Field traffic management personnel were funded to visit adjacent facilities and Airline Operations Centers.

  - o POET Training Classes held in July, August, and September (90 participants received the training).

- System operations advocacy training. (Remove, Concluded in 2001)

- ATT facility manager, TMU Team training. (Remove, Concluded in 2001)

- Leadership pair training. (Remove, Concluded in 2001)

- Traffic Management Officer Conference scheduled for 1/02

- S2K+2 field training (option B) for FAA and users at various geographic locations.

  A mandatory training package is in development to be trained at all FAA facilities.

- ATCSCC training (option A) for FAA and users at the ATCSCC.

- National Traffic Management Course #50113 for FAA and users at the ATCSCC.

11 classes scheduled from January-June

5 classes planned for fall cancelled due to security condition.

- Central Altitude Reservation Course #50114 fro FAA and DOD at the ATCSCC.

  4 classes scheduled

- ATCSCC personnel familiarization visits to field facilities.

- MTO visitations.

- Field traffic management visitations.

- Video development for FAA and user recurrent training programs. (Remove, decision made to incorporate material into the training program)

- Develop revised training package for initial training.

  Revised materials incorporated in Introduction to Traffic Management, FAA course #50113.

- Develop and disseminate revised training materials based on lessons learned for recurring training.

  Training is under development to be available Spring 2002.

- Post Operational Evaluation Tool (POET) training. Post analysis to evaluate events, process, and procedures.

  In addition, post event analysis for feedback and recurrent training is needed to provide information on lessons learned, employing improved techniques and processes.

  Another session is scheduled for fall and this spring.

- Flight Schedule Monitor (FSM) training.

  3 classes scheduled in January to facilitate the expansion of FSM to 27 additional FAA facilities.

Key Decisions

- Providing resources and ensuring maximum participation for joint FAA/User training.

- Access to data, data standards, data sharing, and common metrics for analysis and feedback.

- Site availability for training due to security condition.

Key Risks

- Resources, both internal and external to the FAA organizations